

**Application for Section 18 Emergency Exemption for use of sulfoxaflor (Transform® WG) on soybean
to control soybean aphid (*Aphis glycines*) in Minnesota**

February 16, 2017

Type of Exemption: This application is for a specific emergency exemption for use of sulfoxaflor (Transform® WG Insecticide EPA Reg. No. 62719-625) to control soybean aphid (*Aphis glycines*) on soybean and avert a significant economic loss resulting from development of resistance to pyrethroid insecticides in this pest. This application is formatted as specified in the proposed rules for Chapter 1, Title 40 CFR, Part 166.

Section 166.20(a) 1: Identity of Contact Persons

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Section 166.20(a) 2: Description of Pesticide

- Brand/trade name: Transform® WG
 EPA Reg. No.: 62719-625
 Common name: sulfoxaflor
 Composition: [methyl(oxo){1-[6-(trifluoromethyl)-3- pyridyl]ethyl}-λ6-sulfanylidene]cyanamide
 Formulation: Active ingredient 50%
- Confidential statement of formula: US EPA currently has a Confidential Statement on file for this product.
- Transform WG is currently registered under EPA Reg. No. 62719-625 but does not allow soybean use
- Complete labeling to be used with proposed exemption: See Appendix 1

Section 166.20(a) 3: Description of Proposed Use: Use of this pesticide will not deviate from the previously accepted (i.e., registered) use.

- i. **Sites to be treated:** This pesticide will be used on soybean fields with economic infestations of soybean aphid (*Aphis glycines*).
- ii. **Method of application:** This pesticide will be applied to soybean as foliar applications from ground-based spray equipment or aircraft.
- iii. **Rate of application:** 0.75 – 1.0 oz. of Transform® WG/acre (0.023 – 0.031 lb ai/acre).
- iv. **Maximum number of applications:** The maximum number of applications per growing season at a rate of 0.75 – 1.0 oz./ac (0.023 – 0.031 lb ai/ac) would be one application per crop (as specified on the proposed Minnesota Section 18 label in Appendix 1), which would equate to a maximum of 1 oz/acre per growing season (0.031 lb ai/acre). This maximum number of applications is lower than the label maximum for this use that was previously authorized under the Section 3 registration (four applications per crop at the rate listed above). A single, well-timed (threshold-based) application of an effective insecticide is generally sufficient to protect soybean yield (Ragsdale et al. 2007). The economic threshold for soybean aphid is 250 aphids per plant (Ragsdale et al. 2007)
- v. **Total acreage treated:** Over the last 5 years (2012-2016), soybean has been harvested from 7,181,000 acres per year statewide Minnesota (National Agricultural Statics Service).
- vi. **Total amount of pesticide to be used:** 37% of soybean acres have required treatment with foliar insecticides to protect yields from injury caused by soybean aphid (average from survey of Minnesota agricultural professionals [2013-2014]). Assuming 7,181,000 acres of soybean in Minnesota, with 37% of acres requiring a single well-timed application of this pesticide at the high rate of 1.0 oz/ac, then 265,956 oz (16,622 lbs) of Transform® could be used in 2017.

- vii. **Restriction and requirements:** The proposed Section 18 label for the requested soybean use provides a comprehensive set of restrictions and requirements which have been accepted by US EPA in granting of previous registration for this requested soybean use under Section 3, except this request is for a lower maximum number of applications per crop and the restrictions have been modified accordingly. Note that the final Section 18 label would not include the “Minimum Treatment Interval” statement. At this time no other restrictions and requirements are anticipated.
- viii. **Duration of proposed use:** June 1 to September 15. However, the required pre-harvest interval is 7 days.
- ix. **Earliest possible harvest date:** September 1 is likely the earliest harvest date.

Section 166.20(a) 4: Alternative Control Methods

- i. A detailed explanation of why pyrethroid insecticides are not effective for soybean aphid control can be found in Section 166.20(b) 2.
- ii. Non-chemical control
 - a. Cultural control: Tactics such as adjusting row spacing or planting date are not effective for soybean aphid management (Hodgson et al. 2012).
 - b. Host plant resistance: Aphid-resistant soybean varieties can effectively suppress soybean aphid population growth and protect yield (McCarrville et al. 2014); however, availability of well-adapted aphid-resistant varieties (public or private) is limited for northern states (Hodgson et al. 2012). Therefore, use of aphid-resistant soybean as a control method for soybean aphid is currently not economically feasible.
 - c. Biological control: Though resident natural enemies (predators, parasitoids, pathogens) contribute to prevention and suppression of soybean aphid outbreaks, the control they offer is not consistent and yield-robbing outbreaks of soybean aphid still occur (Ragsdale et al. 2011). Classical biological control, which relies on release of natural enemies from the pest’s native range, is being pursued and several parasitoids (*Binodoxys communis*, *Aphelinus glycinis*, *Aphelinus rhamni*) have been released or are being released for soybean aphid control (Ragsdale et al. 2011; G.E. Heimpel, personal communication). However, the abundance of and control exerted by these parasitoids is still not sufficient to prevent or suppress soybean aphid outbreaks. Therefore, reliance on biological control as a control method for soybean aphid is currently not economically feasible.
- iii. Chemical control
 - a. Seed-applied insecticides: Neonicotinoid seed treatments are used on 34 to 73% of soybean acres (Hodgson et al. 2012; Douglas and Tooker 2015). These seed-applied insecticides, may offer protection of early growth stages of soybean from soybean aphid; however, soybean aphids typically colonize soybean fields after the

concentration of systemic insecticide in the soybean plants has already decreased to ineffective levels (McCornack and Ragsdale. 2006.; Seagraves and Lundgren. 2009). Therefore, use of neonicotinoid seed treatments as a control method for soybean aphid is not economically feasible.

b. Foliar insecticides:

- i. Pyrethroids: In 2015 and 2016, field-level performance issues (failures) with pyrethroid insecticides, primarily bifenthrin (Tundra, Brigade, etc.), formulated mixture of bifenthrin+zeta-cypermethrin (Hero) and lambda-cyhalothrin (Warrior II, etc.), were experienced across a large area in southwestern Minnesota and scattered reports elsewhere (Figure 3).. In both years, visits to several fields with poor pyrethroid efficacy revealed multiple application methods, application dates, and pyrethroid products were involved. Follow-up laboratory assays in both years confirmed resistance to bifenthrin and lambda-cyhalothrin in Minnesota (and Iowa) soybean aphid (Table 8). Further discussion of the pyrethroid resistance is provided in [Section 166.20(b) 2]. Cross resistance to pyrethroid and other insecticides is a documented phenomenon in aphids in general (van Emden and Harrington 2007), in soybean aphid in particular (Xi et al. 2015), and was observed in 2015 and 2016 in Minnesota (Table 8), and could affect efficacy of other pyrethroid insecticides for soybean aphid control.
- ii. Organophosphates: Three organophosphate insecticides are labeled for soybean aphid control. Chlorpyrifos, though effective against soybean aphid, is under intense scrutiny for human-health and water quality impacts. EPA has proposed revocation of all chlorpyrifos tolerances due to human-health concerns resulting from exposures to residues on food and in drinking water. In Minnesota, chlorpyrifos was recently declared a “surface-water pesticide of concern” by the Commissioner of the Minnesota Department of Agriculture (April 2012), because of detections of chlorpyrifos exceeding surface water protection standards established by the Minnesota Pollution Control Agency (MPCA). The MPCA has listed three reaches of waterways as impaired waters for chlorpyrifos under the federal Clean Water Act. Therefore, increased use of chlorpyrifos to compensate for lack of effectiveness of pyrethroid insecticides is not feasible from an environmental or human-health perspective. Furthermore, chlorpyrifos is one of only three active ingredients available for control of two-spotted spider mites, which are a pest of increasing concern in Minnesota. Further complicating this pest concern, two-spotted spider mites have been confirmed to have resistance to chlorpyrifos in Minnesota (Figures 1 and Table 1). Increased use of chlorpyrifos to compensate for lack of effectiveness of pyrethroid insecticides would increase selection pressure for resistance in two-spotted spider mites and further “tie the hands” of Minnesota soybean growers.

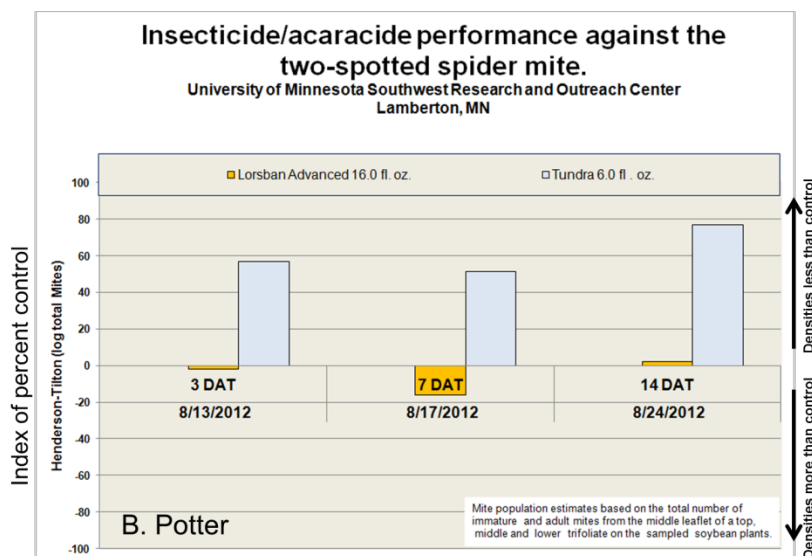


Figure 1: Efficacy of chlorpyrifos (Lorsban) and bifenthrin (Tundra) for two-spotted spider mites in southwestern Minnesota in 2012 (B. Potter, unpublished data). Bars greater than zero indicate effective control of pest and bars near or below zero indicate poor control of pest.

Table 1: Chlorpyrifos susceptibility in two-spotted spider mites collected from southwestern Minnesota in 2012 and compared to a laboratory colony of two-spotted spider mites known to be susceptible to chlorpyrifos (I. MacRae, unpublished data).

	Susceptibility (LC50)		Comparative Resistance Rate
TEST	CO (Susceptible)	MN (Suspected Resistant)	MN/CO
Residual test (Vial Test)	3.21 Lower Limit = 0.10 Upper Limit = 6.32	34.64 Lower Limit = 17.28 Upper Limit = 52.19	10.81
Exposure Test (Dip Test)	3.62 Lower Limit = 1.72 Upper Limit = 5.52	18.46 Lower Limit = 7.95 Upper Limit = 28.97	5.10

Dimethoate is labeled for soybean aphid control; however, control offered by this product is inconsistent [see Table 2 in Section 166.20(a) 5]. Therefore, use of dimethoate to compensate for the lack of effectiveness of pyrethroids to control soybean aphid is not feasible.

- iii. Acephate has residual systemic activity. This insecticide can effectively control soybean aphid (Echtenkamp and Hill 2007, Jewett and Difonzo 2006). In Minnesota, A field study was performed near Lamberton in 2006 to compare the efficacy of acephate and other insecticides for soybean aphid control. Results of this study showed that acephate provided only moderate levels of

control of soybean aphid relative to other insecticides (Table 2). Yields did not differ among treatments (B. Potter, unpublished data). (Table 2), but that is to be expected with soybean aphid densities being lower than the economic injury level (Ragsdale et al. 2007). Therefore, use of acephate to compensate for lack of effectiveness of pyrethroids to control soybean aphid is not feasible.

Table 2: Efficacy of Orthene (acephate) and other insecticides in a field trial performed in 2006 near Lamberton, MN (B. Potter, unpublished data). [Insecticides: Centric=thiamethoxam; Endigo=thiamethoxam+lambda-cyhalothrin, Warrior=lambda-cyhalothrin; Mustang Max=zeta-cypermethrin; Asana=esfenvalerate; Lorsban=chlorpyrifos; Orthene=acephate; F6113=unknown]

Treatment		Soybean aphids /Plant			Yield (Bu/A@ 13%) 10/3/2006 R8
		8/18/2006 R5 3 DAT	8/22/2006 R5-6 7 DAT	8/29/2006 R6 14 DAT	
UNTREATED		319.6 a	339.7 a	233.4 a	53.6 a
CENTRIC	1.5 oz/a	22.5 b	10.3 b	4.1 cd	54.6 a
CENTRIC	2 oz/a	24.6 b	9.4 b	7.1 bc	55.3 a
A13623 (Endigo)	2.05 fl oz/a	13.6 b	1.6 bcd	0.0 e	57.1 a
A13623 (Endigo)	2.74 fl oz/a	2.2 c	0.4 cd	0.2 de	55.7 a
WARRIOR W/ZEON 1CS	2.56 fl oz/a	75.7 b	3.4 bcd	0.1 e	53.3 a
WARRIOR W/ZEON 1CS	3.2 fl oz/a	16.1 b	3.4 bcd	0.0 e	55.0 a
MUSTANG MAX 0.8 EC	4 fl oz/a	54.4 b	21.8 b	24.6 b	54.3 a
F6113	5.12 fl oz/a	1.6 c	0.1 d	0.0 e	55.8 a
ASANA XL	6.4 fl oz/a	21.3 b	11.5 bc	3.1 cd	54.1 a
ASANA XL	9.6 fl oz/a	45.3 b	13.7 b	4.5 bc	54.7 a
LORSBAN 4E	16 fl oz/a	0.5 c	0.2 d	0.2 de	53.0 a
ORTHENE 97	0.75 lb/a	37.2 b	7.0 b	7.0 bc	55.6 a
Treatment Prob(F)		0.0001*	0.0001*	0.0001*	0.8083
Means followed by same letter do not significantly differ (P=.05, Duncan's New MRT)					
* = Mean transformations based on log(SBA/5 plants)					
Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.					
Initial MEAN pre-treatment population 146 SBA/plant 8/14/2006 -1 DAT					

- iv. Carbamates: Methomyl is labeled for soybean aphid. To our knowledge, efficacy of methomyl for soybean aphid control has not been evaluated in or near Minnesota. In addition, potential widespread use of this chemical, over a large geographic area, as often happens in outbreaks of soybean aphid, could lead to human-health and environmental concerns due to the toxicological profile of this insecticide. Additionally, this is the same insecticide group (I) as chlorpyrifos. Therefore use of methomyl to compensate for lack of effectiveness of pyrethroids to control soybean aphid is not feasible.
- v. Neonicotinoids: Increased use of foliar formulations of neonicotinoid insecticides to compensate for lack of effectiveness of pyrethroid insecticides for soybean aphid control is not feasible. In addition, 34 to 73% of soybean acres (Hodgson et al. 2012; Douglas and Tooker 2015) currently receive application of neonicotinoids via seed treatments. Subsequent foliar applications of neonicotinoids during the growing season will increase the risk

for adverse environmental impacts and development insecticide resistance in pests.

- vi. Formulated mixtures: Many mixtures of insecticides are commercially available. Though effective for soybean aphid control, these mixtures comprise pyrethroids, organophosphates and/or neonicotinoids, so the same concerns of economic and environmental feasibility described for the individual insecticides are applicable.

Section 166.20(a) 5: Effectiveness of proposed use

Sulfoxaflor (Transform) is an effective pesticide for control of soybean aphid and protection of soybean yield.

A field study was performed near Lamberton, MN in 2015 to compare the efficacy of sulfoxaflor and other insecticides for soybean aphid control. Results of this study showed that sulfoxaflor significantly reduced aphid abundance over time (summarized as cumulative insect days) and that it also provided statistically significant protection of yield (Table 3) (B. Potter, unpublished data).

Table 3: Efficacy of Transform and other insecticides in a field trial performed in 2015 near Lamberton, MN (B. Potter, unpublished data). [Insecticides: Tundra=bifenthrin; Hero=zeta-cypermethrin+bifenthrin; Warrior II=lambdacyhalothrin; Priaxor=fungicide; Lorsban Advanced=chlorpyrifos; Transform=sulfoxaflor; Fastac=alpha-cypermethrin; Endigo=thiamethoxam+lambdacyhalothrin]

Treatment	rate	CADs	Yield (Bu/A@ 13%)
		0-21 DAT	10/1/2015
UNTREATED		12399.3 a	49.6 c
TUNDRA	5 fl oz/a	1373.3 b	67.9 a
HERO EW	5.12 fl oz/a	1037.4 b	66.8 ab
COC	1 qt/100 gal		
Warrior II	1.6 fl oz/a	3621.8 b	66.0 ab
PRIAXOR	4 fl oz/a	4585.6 b	69.8 a
Warrior II	1.6 fl oz/a		
Non-ionic surfactant	0.25 % v/v		
Lorsban Advanced	16 fl oz/a	384.1 b	68.2 a
TRANSFORM	0.75 oz wt/a	701.7 b	71.4 a
PRIAXOR	4 fl oz/a	416.0 b	71.2 a
TRANSFORM	0.75 oz wt/a		
Non-ionic surfactant	0.25 % v/v		
FASTAC	3.8 fl oz/a	3597.7 b	63.9 ab
Non-ionic surfactant	0.25 % v/v		
PRIAXOR	4 fl oz/a	12054.2 a	60.0 b
Endigo ZC	3.5 fl oz/a	507.8 b	66.8 ab
COC	1 % v/v		
Endigo ZC	4.5 fl oz/a	577.4 b	67.6 a
COC	1 % v/v		
Treatment Prob(F)		0.0001	0.0001
Means followed by same letter do not significantly differ (P=.05, Duncan's New MRT)			
Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.			
t = Mean comparisons based on transformed data (log n+1)			

A field study was performed at two locations in Wisconsin in 2014 to evaluate the efficacy of sulfoxaflor for yield protection in soybean. Sulfoxaflor provide statistically significant levels of yield protection that did not differ from that of a broad-spectrum insecticide (Tables 4 and 5) (J. Hansen).

Table 4. Efficacy of insecticides and resulting yield in a field trial with soybean infested with soybean aphid, 2014, Dr. Jeff Hansen, Deerfield, WI. (sprayed 22Aug2014). [Insecticides: Transform=sulfoxaflor; Cobalt Advanced=chlorpyrifos+lambda-cyhalothrin]

Treatment (rate)	Number per 5 plants					Yield (bu/acre)
	Precount	3DAA ¹	7DAA	14DAA	21DAA	
Transform 50WG (0.75 oz pr/acre)	482 a	0 b	0 b	0 b	0 b	55 a
Cobalt Advanced EW (13 fl oz/acre)	465 a	0 b	0 b	0 b	0 b	56 a
Untreated	458 a	514 a	526 a	576 a	345 a	51 b
	F = 0.157 P = 9.223	F = 1483 P = 0.0001	F = 245 P = 0.0001	F = 226 P = 0.001	F = 207 P = 0.0001	F = 4.678 P = 0.0311

Column means followed by the same letter are not significantly different ($P > 0.05$, LSD).

¹days after application.

Table 5. Efficacy of insecticides and resulting yield in a field trial with soybean infested with soybean aphid, 2014, Dr. Jeff Hansen, Deerfield, WI. (sprayed 21Aug2014). [Insecticides: Transform=sulfoxaflor; Cobalt Advanced=chlorpyrifos+lambda-cyhalothrin]

Treatment (rate)	Number per 5 plants					Yield (bu/acre)
	Precount	3DAA ¹	7DAA	14DAA	21DAA	
Transform 50WG (0.75 oz pr/acre)	642 a	0 b	0 b	0 b	0 b	57 a
Cobalt Advanced EW (13 fl oz/acre)	612 a	0 b	0 b	0 b	0 b	56 a
Untreated	617 a	625 a	560 a	673 a	183 a	53 b
	F = 0.285 P = 0.761	F = 1403 P = 0.0001	F = 70.6 P = 0.0001	F = 97.3 P = 0.001	F = 157.8 P = 0.0001	F = 6.32 P = 0.033

Column means followed by the same letter are not significantly different ($P > 0.05$, LSD).

¹days after application.

A two-year (2013 and 2014) field study was performed at Rosemount, MN to compare the efficacy of sulfoxaflor with λ -cyhalothrin for soybean aphid control. In 2013, the five treatments were: 1) sulfoxaflor at the low labeled rate (25.78 g a.i./ha, Transform), 2) sulfoxaflor at the high labeled rate (34.75 g a.i./ha), 3) λ -cyhalothrin at the low labeled rate (17.46 g a.i./ha, Warrior II), 4) λ -cyhalothrin at the high labeled rate (29.10 g a.i./ha), and 5) untreated check. In 2014, the five treatments were: 1)

sulfoxaflor at the high labeled rate (34.75 g a.i./ha), 2) λ -cyhalothrin + sulfoxaflor at the low labeled rate (22.95 g a.i./ha and 15.30 g a.i./ha, respectively), 3) λ -cyhalothrin + sulfoxaflor at the high labeled rate (28.41 g a.i./ha and 18.94 g a.i./ha, respectively), 4) λ -cyhalothrin at the high labeled rate (29.10 g a.i./ha), and 5) untreated check. Results of this study showed that sulfoxaflor significantly reduced aphid abundance over time (summarized as cumulative insect days) and that the suppression offered by sulfoxaflor did not differ from that of λ -cyhalothrin (Figure 2) (Tran et al. 2016).

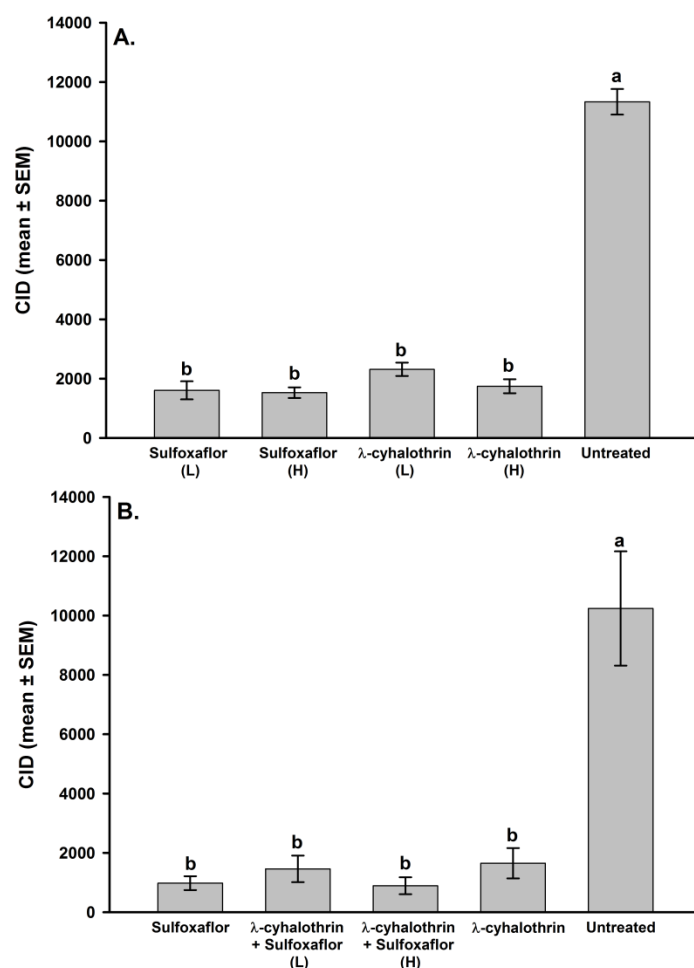


Figure. 2: Cumulative insect days (CID) of soybean aphid under field conditions in Rosemount, MN, in 2013 (A) and 2014 (B). Low and high labeled rates of treatments are represented by L and H, respectively. Treatment means with the same letter are not significantly different (Tukey HSD, $P > 0.05$).

A field study was performed in 2014 in Rosemount to evaluate the efficacy of sulfoxaflor and other insecticides. Sulfoxaflor and the broad-spectrum insecticides significantly reduced aphid abundance over time (summarized as cumulative aphid days) and maintained aphid pressure below the economic injury level of 5,563 cumulative aphid days (Table 6) (Koch et al. in press).

Table 6: Efficacy of sulfoxaflor for soybean aphid control near Rosemount, MN in 2014 (Koch et al. 2016). [Insecticides: Cygon=dimethoate; Transform=sulfoxaflor; Quindigo=thiamethoxam+ lambda-cyhalothrin+fungicide; Warrior II=lambda-cyhalothrin; Assail=acetamiprid; Lorsban Advanced=chlorpyrifos; Endigo= thiamethoxam+lambda-cyhalothrin; Cobalt Advanced=chlorpyrifos+lambda-cyhalothrin; Besiege=chlorotraniliprole+lambda-cyhalothrin]

Treatment/formulation	Rate (amt/ac)	CAD ^{a,b} (mean \pm SEM)
Untreated	—	8,750 \pm 781 a
Cygon 4E	8 fl oz	5,028 \pm 574ab
Cygon 4E	16 fl oz	4,554 \pm 749abc
Transform 50 WG	1 oz wt	2,550 \pm 364bcd
Quindigo 3.15 ZE	14 fl oz	1,978 \pm 410cde
Warrior II 2.09 CS +	1.6 fl oz +	1,662 \pm 275de
Assail 30 SG	1.67 oz wt	
Warrior II 2.09 CS	1.6 fl oz	1,563 \pm 375de
Lorsban Advanced	32 fl oz	1,327 \pm 212de
Endigo ZCX 2.71 ZC	4.5 fl oz	1,326 \pm 488de
Cobalt Advanced 2.63 EC +	26 fl oz +	1,304 \pm 308de
Headline 2.09 EC	12.4 fl oz	
Besiege 1.25 ZC	8.9 fl oz	1,114 \pm 184de
Cobalt Advanced 2.63 EC	26 fl oz	1,009 \pm 138e

^a CAD calculated over season (20 June–25 August).

^b Different letters indicate means that differ significantly, ANOVA, and Tukey's studentized range test (HSD).

A field study was performed in 2011 in Concord, NE to evaluate the efficacy of sulfoxaflor and other insecticides. Sulfoxaflor and the broad-spectrum insecticides significantly reduced aphid numbers per plant, but no difference were observed among the insecticide treatments (Table 7) (Dana et al. 2012). Aphid pressure in this study was below the economic injury level for this pest (Ragsdale et al. 2007), so differences in yield would not be expected.

Table 7: Efficacy of sulfoxaflor for soybean aphid control in Concord, NE in 2012 (Dana et al. 2012). [Insecticides: Transform=sulfoxaflor; Lorsban Advanced=chlorpyrifos; Cobalt Advanced=chlorpyrifos+lambda-cyhalothrin; Warrior II=lambda-cyhalothrin]

Treatment	Rate	Units	Pre	5 DAT	8 DAT	15 DAT	22 DAT	Yield bu/ac
Untreated	N/A		651.8ab	112.7a	98.4a	28a	20a	45.23a
Transform	0.428	oz/acre	667ab	6.3b	0.3b	0.4b	0.5b	44.49a
Transform	0.514	oz/acre	630.8ab	8.8b	8b	3.5b	0.1b	44.26a
Transform	0.714	oz/acre	704.3ab	2.6b	1.1b	0.4b	0.3b	47.95a
Lorsban Advanced	16	fl oz/acre	816.3ab	0.9b	0b	0.1b	0.6b	45.58a
Cobalt Advanced	13	fl oz/acre	610.8b	0.3b	0.1b	0.1b	0.3b	47.74a
Warrior II	1.28	fl oz/acre	942.3a	1.5b	0.2b	0b	0.1b	47.17a

Means with the same letter are not significantly different (LSD, P = 0.05)

Section 166.20(a) 6: Discussion of residues for food use

Residue tolerances have been established for sulfoxaflor in an extensive set of crops, including soybean (40 CFR 180.668). These tolerances are based on field residue trials submitted to US EPA, which were conducted, for soybean, under the use directions (application rates, application timings, pre-harvest interval, etc.) encompassed by the proposed Section 18 label. The tolerance established for soybean seed, resulting from these data, is 0.2 ppm. Tolerances have also been established in meat, milk, poultry and eggs, based on expected residues from treatment of potential feed commodities, including soybean. Furthermore, human dietary risk has been estimated by EPA based on treatment of a wide set of crops, including soybean, and exposure through drinking water, and is below the level of concern. Other relevant tolerance have been established (3.0 ppm for vegetable, legume, foliage, group 7). Therefore, there is a high level of certainty that the proposed use will not result in unreasonable dietary risk.

Section 166.20(a) 7: Discussion of risk information

See appendix 3.

Section 166.20(a) 8: Coordination with other affected State or Federal agencies

The requested use of this pesticide is not likely to be of concern to other state or federal agencies.

Section 166.20(a) 9: Acknowledgement by registrant

Dow AgroSciences has provided a letter of support for this application (see Appendix 2).

Section 166.20(a) 10: Description of proposed enforcement program

The Minnesota Department of Agriculture will take appropriate steps to ensure that the conditions of this exemption are met.

Section 166.20(a) 11: Repeated uses

Not applicable, because this is a first time request.

Section 166.20(b) 1: Name of pest

Soybean aphid (*Aphis glycines*)

Section 166.20(b) 2: Events which brought about the emergency condition

The potential for soybean aphid to develop resistance to insecticides has been a concern, because 1.) management programs for soybean aphid currently rely primarily on only two insecticide groups (pyrethroids and organophosphates) applied as foliar applications for soybean aphid control (Hodgson et al. 2012); and 2.) soybean aphid has been documented to have resistance to pyrethroid and organophosphate insecticides in its native range in China (Wang et al. 2011, Xi et al. 2015).

In 2015 and 2016, field-level performance issues (failures) with pyrethroid insecticides, primarily bifenthrin (Tundra, Brigade, etc.), formulated mixture of bifenthrin+zeta-cypermethrin (Hero) and lambda-cyhalothrin (Warrior II, etc.), were experienced across a large area in southern Minnesota and other scattered reports in each year (Figure 3). In 2015, the highest frequency of problems occurred

with bifenthrin and bifenthrin+cypermethrin in Brown County, eastern Redwood and southern Renville Counties (Figure 3). Visits to several fields with poor pyrethroid efficacy revealed multiple application methods, application dates, and pyrethroid products were involved. In both years, field visits showed areas of good and bad control. The latter of which often occurred in “pockets” (spatial patches) of surviving aphids and included populations at the top of plants, as well as lower in the canopy. These observations indicated that these failures, covering a large geographic area, were not due to a single pyrethroid insecticide or application method. One dealer reported needing to retreat 72% or over 31,000 acres of fields treated with a pyrethroid insecticide in Brown, Redwood and Renville counties in 2015. In 2016, reports of failures were received from as far north as Crookston, MN and as far south as Calumet, IA (Figure 3).

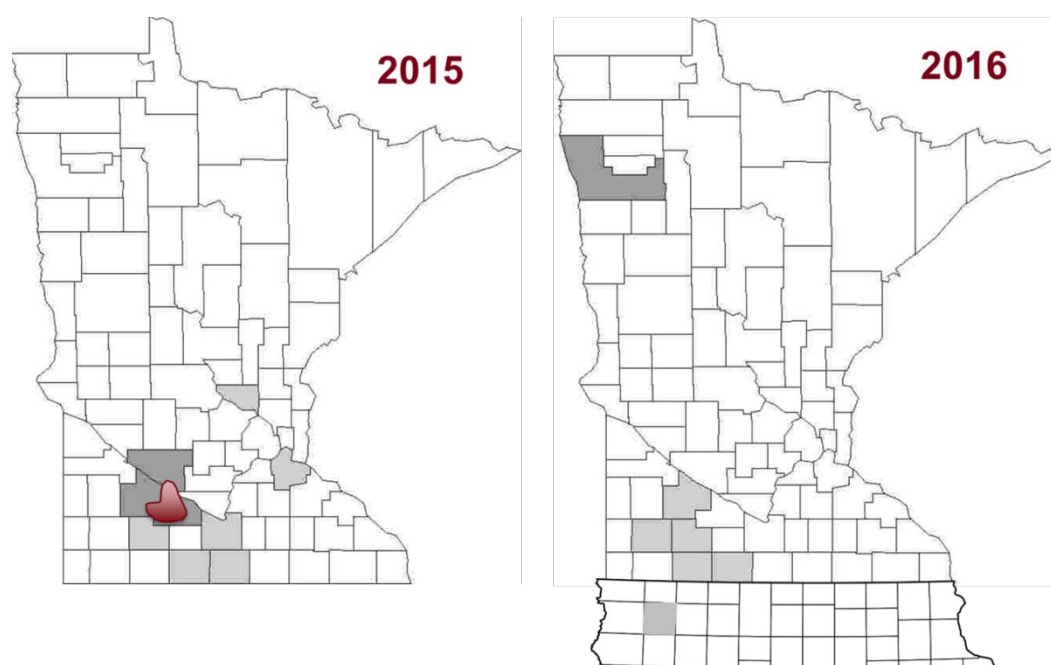


Figure 3: Locations of reported field-level performance problems of pyrethroids for soybean aphid management. Red indicates areas with more widespread reports of performance problems.

In 2015, soybean aphids were collected from a field near Lamberton, MN, in which a failure of Tundra (bifenthrin) occurred. This particular field was treated July 15 and 31 with 4 oz./ac of Tundra and aphid control was still not sufficient to prevent yield loss. The aphids collected from that field of 24 August 2015 were assayed for pyrethroid (bifenthrin and lambda-cyhalothrin) susceptibility under laboratory conditions on the St. Paul campus of the University of Minnesota. A standard glass-vial bioassay was performed on the field-collected aphids and aphids from laboratory colony that is known to be susceptible to insecticides. This laboratory colony was founded from a strain of biotype-1 soybean aphids obtained from the University of Illinois. This strain, collected in 2000, has never been exposed to insecticides since detection in North America. In Saint Paul, the aphids are reared on ‘Williams 82’ soybean plants at the V3 to V5 growth stage in environmental growth chambers at 24°C and a photoperiod of 16:8 (L:D). The glass-vial bioassays showed that the field-collected aphids were 41-fold resistant to bifenthrin and 10-fold resistant to lambda-cyhalothrin based on LC_{50} s (Table 8).

In 2016, the glass-vial bioassay methodology was used to assess susceptibility of multiple soybean aphid populations to pyrethroid insecticides. Soybean aphid were collected from three fields with pyrethroid performance issues (Crookston, MN, Windom, MN and Calumet, IA). The remainder of the aphid were collected from fields prior to application of insecticides. For lambda-cyhalothrin, resistance ratios based on LC₅₀s reached 4- to 12-fold for Calumet, Windom and Crookston (Table 8). For bifenthrin, resistance ratios based on LC₅₀s reached 4- to 9-fold for Windom and Lamberton (Table 8)

Table 8: Results of a glass-vial bioassay with bifenthrin and lambda-cyhalothrin to compare susceptibilities of field-collected soybean aphids to a laboratory colony of soybean aphids known to be susceptible to insecticides in 2015 and 2016. Susceptibility of populations was quantified as an LC₅₀ or LC₉₀, which represent concentrations of insecticide required to kill 50 or 90% of the populations. Magnitude of resistance of field population relative to laboratory population is expressed as a resistance ratio (R.R.).

Insecticide	Year	Location	LC50				LC90			
			ng/vial	± 95% C.L.		RR	ng/vial	± 95% C.L.		RR
Lambda-cyhalothrin	2015	Laboratory	12.5	9.07	15.8	1.00	26.9	19	34.8	1.00
		Lamberton	134	32.9	245	10.8	325	69.2	642	12.1
	2016	Rochester	28.3	21.5	35.2	0.902	66.4	48.8	84.3	0.949
		Laboratory	31.4	27.3	35.5	1.00	70	59.9	80.2	1.00
		Lamberton	41.2	32.5	50.1	1.31	86.3	65.8	107	1.23
		Chandler	64.4	49.1	79.9	2.05	163	120	207	2.32
		Calumet, IA	142	105	180	4.51	444	313	590	6.35
		Windom	146	116	178	4.66	326	248	409	4.66
		Crookston	406	297	524	12.9	1590	1040	2290	22.7
Bifenthrin	2015	Laboratory	3.67	2.63	4.72	1.00	7.77	5.37	10.2	1.00
		Lamberton	154	113	196	41.8	339	240	446	43.6
	2016	Laboratory	7.51	6.56	8.47	1.00	15	12.9	17.1	1.00
		Rochester	9.13	7.13	11.1	1.22	19.4	14.6	24.3	1.30
		Chandler	17.3	13.5	21.2	2.31	39.5	29.8	49.3	2.64
		Crookston	22.6	17.9	27.4	3.01	47.7	36.7	58.7	3.19
		Lamberton	23.9	18.9	28.9	3.18	51	39.4	62.8	3.41
		Calumet, IA	28.3	20.1	36.6	3.77	92.4	64.3	121	6.17
		Windom	32.9	25.9	39.8	4.38	71.4	54.8	88.1	4.77
		Lamberton, early	72.7	57	88.6	9.68	156	118	196	10.4

Section 166.20(b) 3: Anticipated risks to endangered or threatened species, beneficial organisms, or the environment that would be remedied by use of the pesticide

Soybean aphid management currently relies primarily on foliar applications of pyrethroid and organophosphate insecticides (Hodgson et al. 2012). With soybean aphids resistant to pyrethroids, most growers will rely on using chlorpyrifos to control soybean aphid. Chlorpyrifos is highly toxic to natural enemies (e.g., lady beetles) in Minnesota soybean production (Galvan et al. 2005). A series of laboratory assays were performed to assess toxicity of sulfoxaflor to natural enemies of soybean aphid (rates correspond to those used in the experiments for Figure 2). Sulfoxaflor is less toxic than broad-

spectrum insecticides to predators of soybean aphid (Tran et al. 2016; Knodel et al. 2016) (Figure 4). Use of sulfoxaflor would greatly reduce adverse impacts to natural enemies of the soybean aphid and decrease the likelihood of pest resurgence and replacement due to removal of natural enemies.

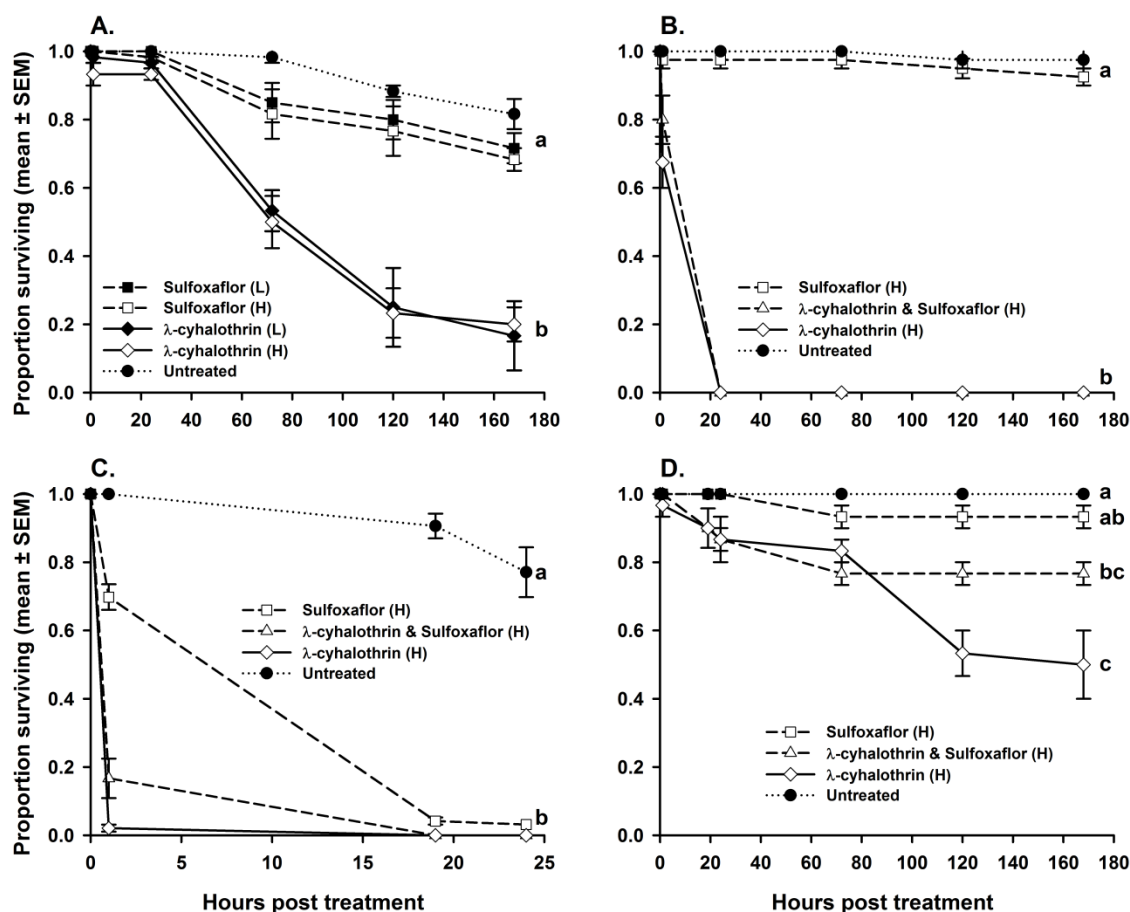


Figure 4: Survival of lady beetle (*Hippodamia convergens*) adults (A and B), minute pirate bug (*Orius insidiosus*) adults (C), and green lacewing (*Chrysoperla rufilabris*) larvae (D) under laboratory conditions. Low and high labeled rates of treatments are represented by L and H, respectively (see text). Treatments with the same letter are not significantly different (Tukey HSD, $P > 0.05$) (Tran et al. 2016). [

Section 166.20(b) 4: Anticipated significant economic loss

Soybean aphid is a persistent problem in Minnesota, with some areas of the state requiring foliar application of insecticides for yield protection from this pest. This pest occurs throughout the soybean producing region of Minnesota (Ragsdale et al. 2011). For purposes of this application, the “routine situation” is defined as soybean aphid control with the commonly used insecticides (e.g., pyrethroid insecticides) working effectively. The “non-routine situation” is defined as soybean aphid control with ineffective pyrethroid insecticides, due to soybean aphid resistance to the pyrethroids insecticides. The recent development of soybean aphid resistance to pyrethroid insecticides is a concern of high priority to Minnesota soybean growers (see Appendix 4). The level of potential ineffectiveness of pyrethroid insecticides under the “non-routine situation” is shown in field data from a location in southwestern

Minnesota in 2015 where soybean aphid populations were growing as fast as or faster in pyrethroid treated plots than in untreated plots (Figure 5).

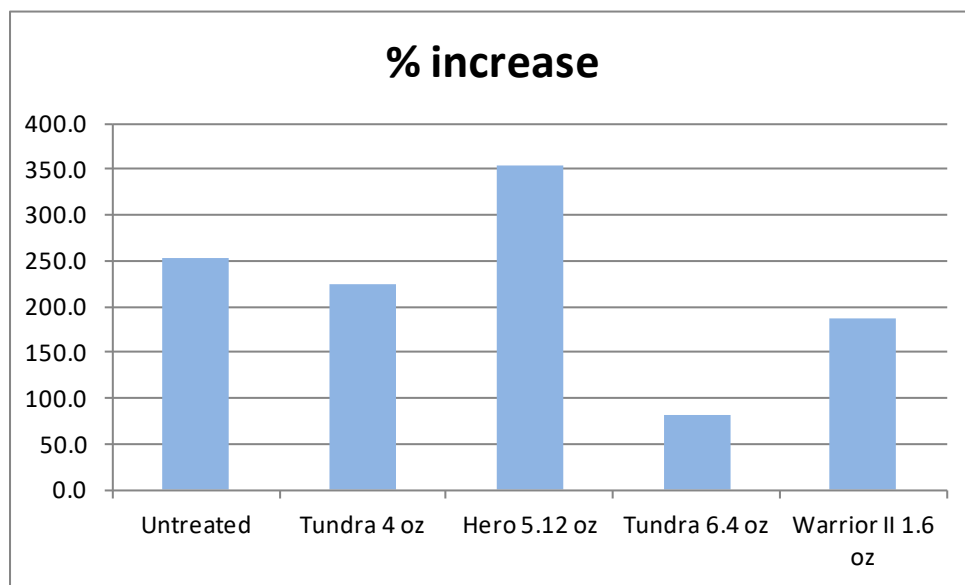


Figure 5: Efficacy of insecticides, measured as soybean aphid population growth rates, 7 days after treatment in a field at Sanborn, MN, 2015 (B. Potter, unpublished data). [Insecticides: Tundra=bifenthrin; Hero=zeta-cypermethrin+bifenthrin; Warrior II=lambdacyhalothrin]

Therefore, yield loss estimates from experiments with soybean aphid infestations in untreated soybean compared to insecticide treated soybean will provide a relevant estimate of the economic loss due to this emergency. Yield loss caused by this insect has been studied intensively and can approach 40% yield loss (Figure 6) (Ragsdale et al. 2007).

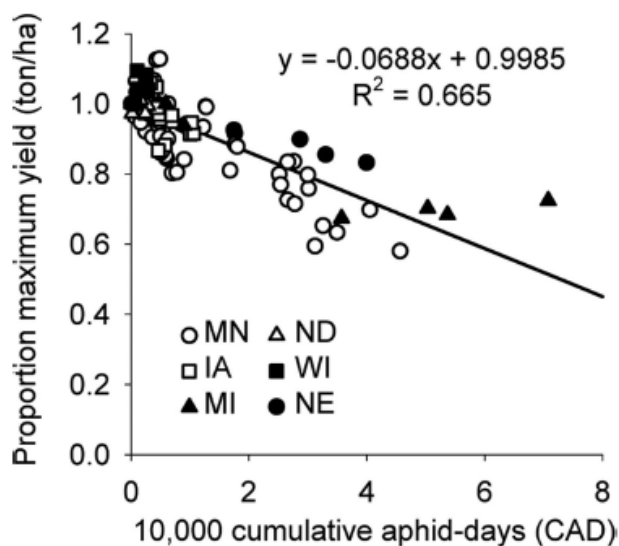


Figure 6: Percentage of maximum yield comparing plots with the target aphid density of 0 CAD to plots with target aphid densities for all 19 location-years (n=116) (Ragsdale et al. 2007).

Soybean yield losses of up to 40% experienced by individual growers would decrease yields from 45.9 bushels per acre (5-yr average from USDA NASS for Minnesota) to 27.5 bushels per acre, which would decrease revenue from \$526 to \$316 per acre (assuming a per-bushel price of \$11.48, 4-yr average from USDA NASS for Minnesota). **Therefore, the economic significance of this emergency surpasses the Tier-1 threshold.**


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Appendix 1: Proposed Section 18 label for Transform WG (sulfoxaflor) from Dow AgroSciences.

Note: the final label would not include the “Minimum Treatment Interval” stated below.

		Dow AgroSciences
Dow AgroSciences LLC	9330 Zionsville Road	Indianapolis, IN 46268-1054 USA
<h2 style="margin: 0;">Transform® WG</h2> <p style="margin: 0;">For Control of Soybean Aphid in Soybean</p> <p style="margin: 0;">Section 18 Emergency Exemption</p> <p style="margin: 0;">File symbol: 17MNXX</p>		
<p>FOR DISTRIBUTION AND USE ONLY IN MINNESOTA UNDER SECTION 18 EMERGENCY EXEMPTION</p> <p>This Section 18 Emergency Exemption is effective XXXX and expires XXXX.</p>		
<ul style="list-style-type: none"> This labeling must be in the possession of the user at the time of application. It is in violation of federal law to use this product in a manner inconsistent with its labeling. Read the label affixed to the container for Transform® WG insecticide before applying. Carefully follow all precautionary statements and applicable use directions. Any adverse effects resulting from the use of Transform WG under this emergency exemption must be immediately reported to the Minnesota Department of Agriculture. 		
<h3 style="margin: 10px 0;">Directions for Use</h3>		
<p>Pests and Application Rates:</p>		
Pests	Transform WG (oz/acre)	Comments
Soybean aphid	0.75 – 1.0 (0.023 – 0.031 lb ai/acre)	Use a higher rate in the rate range for heavy pest populations.
<p>Application Timing: Treat in accordance with local economic thresholds. Consult your Dow AgroSciences representative, cooperative extension service, certified crop advisor or state agricultural experiment station for any additional local use recommendations for your area.</p>		
<p>Application Method: Control of soybean aphid may be contingent on thorough coverage to the crop. Use sufficient water to get full coverage of the canopy. It is recommended that a minimum of 5 gallons of water be applied by air.</p>		
<p>Restrictions:</p> <ul style="list-style-type: none"> Preharvest Interval: Do not apply within 7 days of grain, forage or hay harvest. Minimum Treatment Interval: Do not make applications less than 14 days apart. Do not make more than one application per crop. Do not apply more than a total of 1.0 oz of Transform WG (0.031 lb ai of sulfoxaflor) per acre per year. 		
<p>®Trademark of The Dow Chemical Company (“Dow”) or an affiliated company of Dow</p> <p>R396-139</p> <p>Approved: <u> </u>/<u> </u>/<u> </u></p> <p>Replaces: Initial printing</p>		

Appendix 2: Letter of support from Dow AgroSciences.**Dow AgroSciences**

Dow AgroSciences LLC
9330 Zionsville Road
Indianapolis, IN 46163

dowagro.com

March 30, 2017

Dr. Robert Koch
Assistant Professor & Extension Entomologist
Department of Entomology
416 Hodson Hall
University of Minnesota
Saint Paul, MN 55108

Re: Support letter for Transform™ WG Section 18 on soybean

Dear Dr. Koch,

Per your request, this letter is to confirm that Dow AgroSciences supports the pursuit of a Section 18 emergency exemption for Transform WG to control soybean aphid in soybean in the state of Minnesota. For the relatively short-term purposes of this Section 18 application, Dow AgroSciences believes limiting use to a single application would be acceptable, although we believe growers will eventually need the flexibility to make multiple applications for long-term aphid management.

Transform WG has provided excellent efficacy against the soybean aphid in previous use, with no negative impacts on non-target insects. It also represents a new class of chemistry with a novel mode of action, and controls pests resistant to other classes of chemistry.

If you have questions, please do not hesitate to call me.

Sincerely,

A handwritten signature in black ink, appearing to read "Jamey Thomas".

Jamey Thomas, Ph.D.
US Regulatory Manager
Dow AgroSciences

cc: Dave Ouimette, DAS
Melissa Siebert, DAS
Dave Ruen, DAS

™Trademark of Dow AgroSciences LLC

Appendix 3: Discussion of risk information (information compiled by Minnesota Department of Agriculture).

Sulfoxaflor

CAS 946578-00-3; EPA PC CODE 005210

New Active Ingredient Review
March 2013

PESTICIDE TYPE	Insecticide
CHEMICAL CLASS	Sulfoximines
IRAC Code	4C
COMMON TRADE NAMES	Closer, Transform
MAJOR DEGRADATE	X-11719474 (X-474)
APPLICATION RATE (lbs a.i./A)	Single: 0.043-0.086 Max Annual: 0.266
REGISTRATION STATUS	EPA: 2013 Minnesota: June 2013
TOXICITY PROFILE FOR APPLICATORS	Signal word: Caution (Closer) or Danger (Transform) Toxicity III or IV
BASIC MANUFACTURER	Dow AgroSciences
MDA LABORATORY CAPABILITIES	In discussion

HUMAN HEALTH

NON-CANCER	Acute PAD = 0.06 mg/kg/day Chronic PAD = 0.05 mg/kg/day
CANCER	Suggestive evidence of carcinogenic potential

Acute and chronic PADs are doses that include all relevant uncertainty and safety factors

ENVIRONMENTAL AQUATIC TOXICITY

FISH	Acute: >181,500 ppb Chronic: 660 ppb
INVERTEBRATE	Acute: >200,000 ppb Chronic: 50,500 ppb
AQUATIC PLANTS	Vascular: >99,000 ppb Non-vascular: 81,200 ppb

POLLINATOR TOXICITY

HONEY BEE	Acute Contact: 0.052 µg ai/bee Acute Oral: 0.0208 µg ai/bee
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Level of Concern (LOC) has been applied to all values

Introduction

Sulfoxaflor is the first member of sulfoximines class of insecticides. It is considered an agonist of nicotinic acetylcholine receptor (nAChR). In laboratory experiments, sulfoxaflor was found to be highly efficacious against target insects those displayed resistant to neonicotinoids such as imidacloprid. Sulfoxaflor is a systemic insecticide registered by EPA to control piercing/sucking insects such as aphids, stink bugs, plant bugs, and thrips on a variety of row crops. Sulfoxaflor is formulated as a suspension-concentrate (SC) and as water dispersible granules (WDG) containing. Applications can be made with either ground or aerial equipment. Sulfoxaflor can also be applied through chemigation system.

It was first registered by EPA for emergency use on cotton to control tarnished plant bug, *Lygus lineolaris* in the state of Mississippi, Arkansas, Louisiana, and Tennessee in June 2012. Its use was extended to other crops in 2013. Sulfoxaflor is registered for use in Minnesota in June 2013. Minnesota Department of Agriculture (MDA) extensive review of the U.S. Environmental Protection Agency (EPA) sulfoxaflor labels and risk assessments for issues relevant to Minnesota is summarized below.

Projected Use in Minnesota

Sulfoxaflor may be registered for use on the following major crops in Minnesota: soybeans, potatoes, wheat. According to UMN extension, sulfoxaflor worked well against aphids in soybean and potatoes. It will be of use against piercing/sucking insects such as aphids, leafhoppers, plant bugs, etc. It is not labeled for residential uses.

This insecticide is found in 2 end-use unconditionally registered products:

- **Closer™ SC (EPA Reg. No. 62719-625)** – a suspension concentrate (SC) for foliar application to all approved crops. Closer is not labeled for use on soybean, potato and wheat crops.
- **Transform™ WG (EPA Reg. No. 62719-623)** – a water dispersible granular (WDG) product for foliar application to all approved crops.

Label Environmental Hazards

Water Quality:

- Label for applications carry advisories for surface water impacts.

Other:

- This product is highly toxic to bees exposed through contact during spraying and while spray droplets are still wet. This product may be toxic to bees exposed to treated foliage for up to 3 hours following application. Toxicity is reduced when spray droplets are dry.
- Risk to managed bees and native pollinators from contact with pesticide spray or residues can be minimized when applications are made before 7:00 am or after 7:00 pm local time or when temperature is below 55 F at the site application.
- There are additional restrictions and/or advisories to protect pollinators on wheat, canola and fruit and vegetable crops.

MINNESOTA DEPARTMENT
OF AGRICULTURE

In accordance with the American with Disabilities Act, this information is available in alternative forms of communication upon request by calling 651-201-6000. TTY users can call the Minnesota Relay Service at 711 or 1-800-627-3529. The MDA is an equal opportunity employer and provider.



In accordance with the American with Disabilities Act, this information is available in alternative forms of communication upon request by calling 651-201-6000. TTY users can call the Minnesota Relay Service at 711 or 1-800-627-3529. The MDA is an equal opportunity employer and provider.

Toxicology and Exposure

EPA's screening models generate high-end, conservative exposure estimates for active ingredients and toxicologically significant degradates. Model inputs include annual usage at maximum use rates, maximum treated acres, maximum food residues, peak runoff and drift scenarios, etc. Some proposed products, application rates and use scenarios are not relevant to Minnesota. EPA's estimates, therefore, may not reflect future use and impacts in Minnesota.

Human Health

- **Carcinogenic Effects**- Classified as "Suggestive Evidence of Carcinogenic Potential." EPA has determined the chronic population adjusted dose (PAD) is protective of all long-term effects, including potential carcinogenicity. As a result, a separate dietary exposure assessment for the purpose of assessing cancer risk was not necessary.
- **Drinking Water Guidance**- Model estimates suggest that degradates will be found in groundwater to a greater degree than the parent sulfoxaflor. This is due to sulfoxaflor rapidly degrading in soil. Residues in groundwater will primarily be made up of the degrade X11719474 (X-474) and to a lesser extent X11519540 (X-540). For more information on degrade toxicity see "Degradates" section. High-end, screening exposure estimates for drinking water suggest that applications of sulfoxaflor degradates may result in surface water and groundwater detections; however, EPA concludes that conservative exposure estimates are below levels of concern for the general population and all population subgroups.
- **Occupational Exposure**- Protective eyewear was added for use of Transform due to Category II acute ocular toxicity.

Environment- Non-target Species

- **Stressor of concern** – For aquatic organisms parent sulfoxaflor plus its degrade X11519540; for terrestrial organisms sulfoxaflor only.
- **Aquatic Life Exposure** – High end screening exposure estimates for risks to fish and invertebrates did not generate concern for aquatic life. Estimates suggest that surface water concentrations will not exceed 10% of the available aquatic life toxicity benchmark. Bioaccumulation is not expected in aquatic life.
- **Pollinators**-Sulfoxaflor is highly toxic to honeybees on acute exposure basis. Label statements are designed to mitigate these effects.

Environmental Fate

The fate of sulfoxaflor in the environment is highly dependent on whether it is in a soil system, groundwater system, or surface water system. Environmental fate characteristics are listed for parent and all relevant degradates where appropriate.

Soil

- **Half-life**- Aerobic: Sulfoxaflor = < 1 day; X-474 = > 1,000 days; X-540 = 2,808 days
Anaerobic: Sulfoxaflor = 113-120 days; X-474 = 1,090-5,270; X-540 = Not available
- **Adsorption** (mL/g) - Parent/degradates are very high to highly mobile. Sulfoxaflor = K_{100C} 11-72; X-474 = K_{100C} 7-68; X-540 = K_{100C} 1-25
- **Persistence**- Sulfoxaflor is expected to be non-persistent in soils and exhibits low affinity to soil or sediment particles. In the aerobic soil system, sulfoxaflor degrades into metabolites. Degradates are considered to be highly persistent in soil.

Aquatic

- In both aerobic and anaerobic aquatic conditions sulfoxaflor degrades slowly to X-474 (Half-life- Aerobic - 37-88 days, Anaerobic- 103-382 days). Degrade X-474 is expected to be more persistent than its parent in both aerobic and anaerobic aquatic systems.
- Sulfoxaflor is not expected to partition into the sediment.
- **Surface water**- Sulfoxaflor is expected to be the principle residue in surface water. Contamination of surface water is expected to be mainly related to drift and very little due to run-off. This is because sulfoxaflor drift that reaches aquatic systems is expected to persist while that reaching soil will degrade. Surface water is also expected to be contaminated by X-474 and X-540.
- **Groundwater**- Sulfoxaflor is expected to be absent from groundwater. Degradates X-474 and, to a lesser extent, X540 are expected to be found in groundwater.
- **Hydrolysis in water**: Parent and degradates characterized as stable.

Air

- **Volatilization**- Not a major route of dissipation. Vapor pressure = $< 2.5 \times 10^{-6}$ pa; Henry's Law = 1.2×10^{-11} atm m³ mole⁻¹.

Degradates

Sulfoxaflor has three important degradates; one major degrade, X-474, and two minor degradates, X-540 and X11579457 (X-457). Available evidence indicates that X-474 and X-457 is much less toxic to humans and the environment than the parent. X-540 appears to be more toxic than sulfoxaflor, but is not expected to be found at high concentrations.

Appendix 4: Letter of support from Minnesota Soybean Grower Association for Section 18 Emergency Exemption for use of sulfoxaflor against soybean aphid.



February 13, 2017

Dave Frederickson
Commissioner
Minnesota Department of Agriculture (MDA)
625 Robert Street North
St. Paul, MN 55155-2538

Dear Mr. Frederickson:

The Minnesota Soybean Growers Association supports the application for Section 18 Emergency Exemption for use of sulfoxaflor (Transform® WG) on soybeans to control soybean aphids in Minnesota.

Soybean aphids are the single most important insect affecting soybean production in Minnesota. Approximately 35-40 percent of Minnesota's 7 million acre soybean crop receives at least one insecticide application annually to control this pest. Yield loss has been reported to approach 40 percent. Biological control and genetic resistance are not currently viable control options for soybean aphids in Minnesota. Use of foliar insecticides against this pest remains critical to soybean grower success.

In 2015 and 2016, aphid resistance to pyrethroid was reported to University of Minnesota Extension in several counties across the state. Two other insecticide groups (organophosphates and neonicotinoids) are also available for aphid control in Minnesota soybeans. However, both are under intense scrutiny by federal and state regulatory agencies. The primary organophosphate used by Minnesota soybean farmers, chlorpyrifos, is effective but has a short residual control period. It is also a broad spectrum insecticide which would, if applied, suppress the aphid predator population simultaneously. Properly applied neonicotinoids may provide effective aphid control; however, as you know, MDA is concerned about potential environmental impacts on pollinators if foliar applications increase. Neonicotinoids are frequently applied as a seed treatment to many of the soybean acres planted in Minnesota. These treatments only provide aphid protection for plants in early growth stages leaving the plant unprotected at the most economically susceptible growth stages.

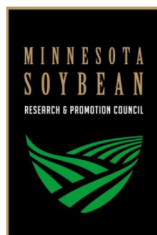
Research presented and published by the University of Minnesota found sulfoxaflor to be effective in controlling soybean aphids and is less toxic to beneficial insects than other insecticides. This product would enhance soybean aphid control and provide assistance in developing an effective insecticide resistance management program. The ability for Minnesota soybean growers to use sulfoxaflor as a management tool for soybean aphids would provide significant and widespread economic and environmental benefits to Minnesota.

Thank you for your time and consideration.

Sincerely,

Theresia Gillie
President
Minnesota Soybean Growers Association

Appendix 5: Letter of support from Minnesota Soybean Research and Promotion Council for Section 18 Emergency Exemption for use of sulfoxaflor against soybean aphid.



February 10, 2017

Dave Frederickson, Commissioner
Minnesota Department of Agriculture (MDA)
625 Robert Street North
St. Paul, MN 55155-2538

Dear Mr. Frederickson:

The Minnesota Soybean Research & Promotion Council supports the application for Section 18 Emergency Exemption for use of sulfoxaflor (Transform® WG) on soybeans to control soybean aphids in Minnesota.

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Thank you for your time and consideration.

Sincerely,

Keith Schrader
Chairman, MSR&P

151 Saint Andrews Court Suite 710 Mankato, MN 56001 P: 507.388.1635 F: 507.388.6751 mnsoybean.org